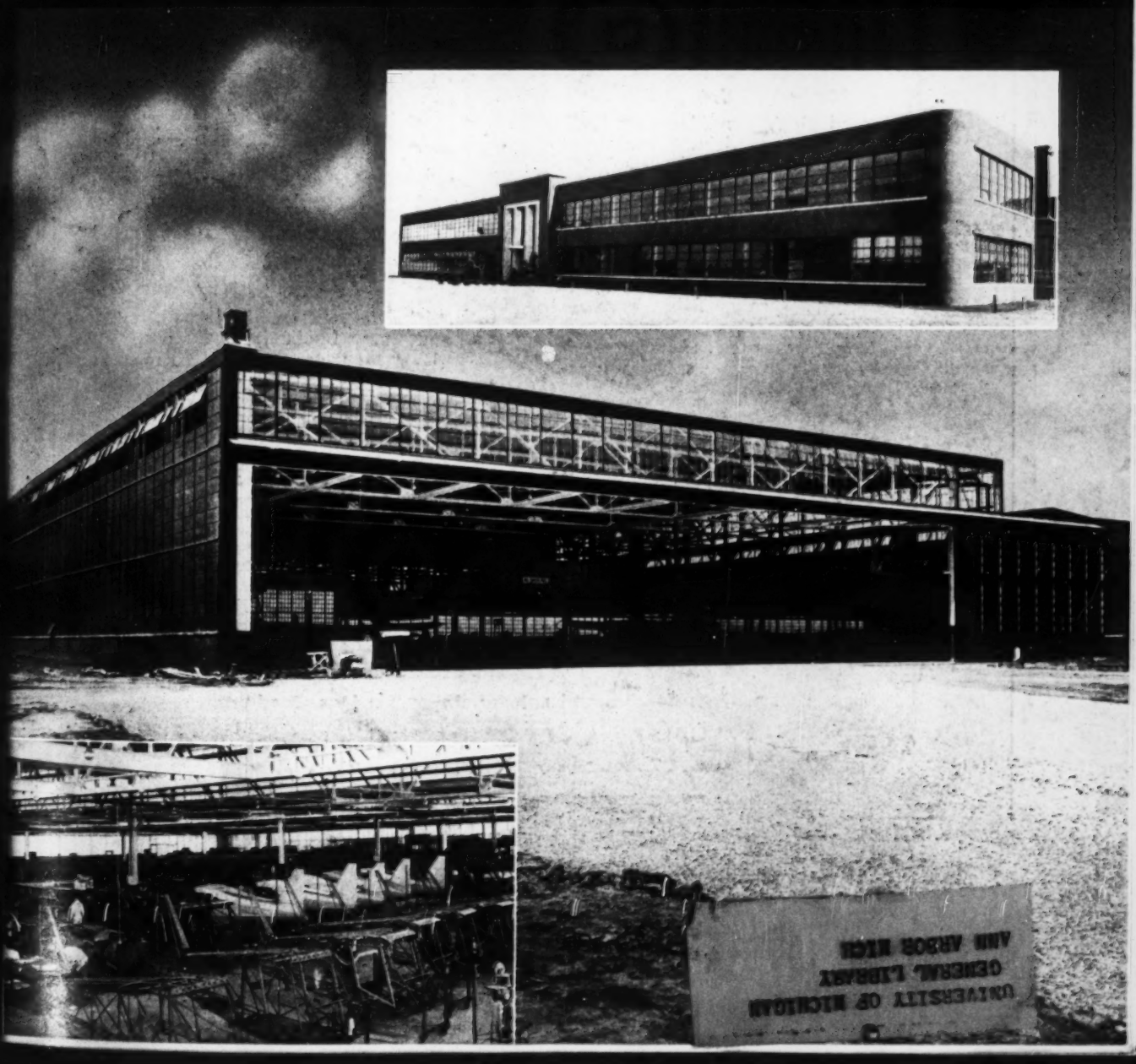
# ENGINEERING NEWS-RECORD

First Major Aircraft Factory in the South Completed – See page 2



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# LEADITE

## *The Pioneer Self-Caulking Jointing Material for Bell and Spigot Water Pipe*

### Products

LEADITE and the following tools and equipment for use with LEADITE:

BRAIDED JUTE, JOINT RUNNERS, GASOLINE and WOOD BURNING MELTING FURNACES, POURING LADLES, POURING POTS, YARNING IRONS and METAL POURING GATES.

### *Description*

Leadite is principally used for making joints in cast iron bell and spigot water mains; is shipped in powder form in sacks containing 100 pounds.

### *Users*

Water works superintendents, engineers, contractors, mines, railroads and industrial plants all over the world use Leadite. Thousands of miles of pipe jointed with Leadite are in service.

### Method of Use

The joint space is first "yarned" and the Leadite is melted and poured into the joint, but requires no caulking. Leadite melts at approximately 250° F. Lead melts at approximately 620° F.

### Comparative Quantities

One hundred pounds of Leadite are equivalent to approximately four hundred pounds of pig lead based on the joints being made the same depth with either material. It will be easy to figure the approximate quantity of Leadite required for any given quantity of pipe by referring to our Reference Table, copy of which we shall gladly send to you upon request.

### Comparative Cost

Under normal conditions, the economies effected by the use of Leadite save approximately 50% to 75% over the method which requires caulking, owing to the saving effected in material and labor.

### Saving

Because Leadite saves on the items of caulking charges, digging of large bell-holes and reduces cost of trench pumping to a minimum, Leadite eliminates most every superfluous operation in jointing cast iron water mains, thus permitting the work to be completed with the least amount of effort.

### Tools

As no caulking is required, fewer tools are needed.

### No Caulking

Leadite joints require no caulking because Leadite adheres to the pipe from the yarn or jute out to face of bell, making a watertight bond. However, a Leadite joint may be melted or cut out at any time if desired in making connections, etc.

### Durability

Leadite has been tested and used for more than 35 years and experience has proven that Leadite joints improve with age.

### Expansion and Vibration

Leadite is used with excellent results under railroad tracks, highways and over and under bridges where severe vibration has demonstrated the value of using Leadite on this class of work.

### Utility

Leadite is very easy to handle. It is used on all sizes of pipe from four to eighty-four inches in diameter and under all conditions and pressures encountered in water works construction.

### Electrolysis

Leadite resists electrolysis.

### Damage Suits

Claims for damages caused by joints blowing out are reduced because Leadite joints, if properly made, will not blow out under any pressure common in water works construction.

### Transportation

Considerable freight charges are saved because Leadite is light in weight. This also means a saving in cartage and handling on the work because you move approximately one-fourth the weight of jointing material.

### Delivery

We make prompt shipments of Leadite in any quantities from stock.

### Fuel

Saves fuel because you melt approximately one pound of material instead of four, and less heat is required to melt Leadite than is needed to melt lead.

**Be sure it is Leadite and not something "Just as Good"**

**THE LEADITE COMPANY**

**Girard Trust Company Bldg., Philadelphia, Pa.**

The Week In Engineering and Construction

ENGINEERING NEWS-RECORD • JULY 25, 1940

# Smaller contractors not to be overlooked by Navy

## Policy on construction work includes a place for the small as well as the large contractor

Because a good many of the construction contracts for shore facilities that have been negotiated by the Bureau of Yards and Docks of the Navy have so far gone to the larger contracting firms of the country, there has been some fear on the part of the smaller contractors that they were destined for a "forgotten man" role in the national defense program. From an authoritative source in the Navy Department it is learned that these fears are entirely unfounded. There is official belief that it would represent a great economic waste to overlook the productive capacity represented by the smaller contractor. Therefore, the Bureau of Yards and Docks will do a great many small jobs by competitive bidding; being small or perhaps of less urgent nature than the larger airbase and shipyard work, time is available to prepare plans and specifications.

As is evident from work already awarded it is also the intention of the Bureau to give fee contracts to individual small contractors whenever they can handle the work, or to award such contracts for bigger projects to a combination of small contractors. In addition to these sources of work for the small contractors, there is also the possibility of subcontracts on the very large jobs although this practice is carefully controlled by the Bureau to prevent a general contractor from serving merely as a broker and subbing most of the work. The general philosophy was stated by Rear Admiral Ben Moreell, chief, Bureau of Yards and Docks, during the hearings in connection with the negotiations of two of the larger contracts. "In the matter of subcontracts," said Admiral Moreell, "we do not desire to enter into an arrangement whereby a contractor will act as a broker for the government. We can do that ourselves. We want the experience of a going organization that can go on the job and handle it from top to bottom without being concerned with a great multitude of subcontracts. I don't mean to imply that we will not permit any subcontracts. Of course we will. But there must be some adjustment if you allow subcontracts on a fee basis so that we will not be paying a fee on a fee. We would expect that the principal contractor to whom we would give a contract of this kind would be very meticulous in his decision as to what work should be performed by subcontractors so that there will be some regard paid to the multiplication of profits."

The Bureau's sole objective, plainly, is to achieve maximum speed and economy. No other considerations than ability govern the selection of contractors, according to a Navy Department spokesman, who also pointed out that no contractor, large or small, can hope to gain any advantage through attempts to present his case through political channels. It is only necessary that a contractor, to receive consideration, should supply the Bureau of Yards and Docks with necessary information concerning his experience on both fee and competitive bid construction and on his available plant, equipment and financial resources. A large number of contractors have already followed this procedure.

### Directs Idaho highways

*C. P. Humphrey, first employed by the Idaho Bureau of Highways in 1919, has been named director of highways to succeed H. R. Flint, who has joined the R. M. Hardesty Mfg. Co. at Pocatello, Idaho. Humphrey was first employed by the Idaho department as draftsman, then held the position of resident engineer on concrete and bituminous pavement, later location engineer, and then was made state bituminous engineer in charge of oiling. In 1931 he left the department to go into contracting work. In 1935 he re-joined the department as resident engineer, being made district engineer in January, 1939.*

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## Advisory group named for defense construction

Civilian engineers, architects and contractors make up a six-man committee appointed by the Army and Navy Munitions Board to give it advice in connection with the formulation and review of plans pertaining to defense construction. Although the committee was appointed last May and has functioned continuously since, the names of the members were first made public on July 22. Headed by John P. Hogan, president, American Society of Civil Engineers, as chairman, the committee consists of Alonzo J. Hammond, consulting engineer, Chicago, and president of the American Engineering Council; E. J. Harding, general manager of the Associated General Contractors of America; E. P. Palmer, of the New York contracting firm of Senior & Palmer and past president of the Associated General Contractors of America; Malcolm Pirnie, New York consulting engineer and general chairman of the Construction League of America; and Stephen F. Voorhees, New York architect and past president of the American Institute of

Architects. The committee will also work in close cooperation with the National Advisory Defense Commission and particularly with W. H. Harrison, recently appointed head of the commission's construction division.

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## Canadian engineers to aid evacuees

The Vancouver Branch of the Engineering Institute of Canada, July 17, endorsed a plan to bring to Canada the children of those engaged in the engineering profession in England. The children of between 50,000 and 60,000 English engineers would be aided according to the plan.

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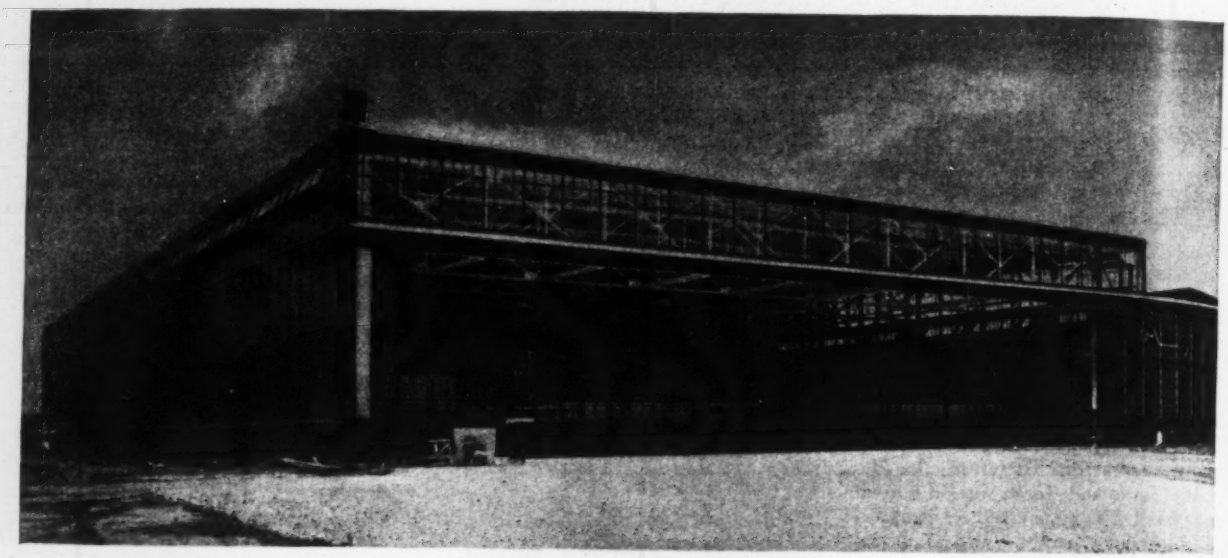
## Coordinator appointed for defense housing

Charles F. Palmer, Atlanta real estate expert and president of the National Association of Housing Officials, has been appointed housing coordinator by the National Defense Advisory Commission.

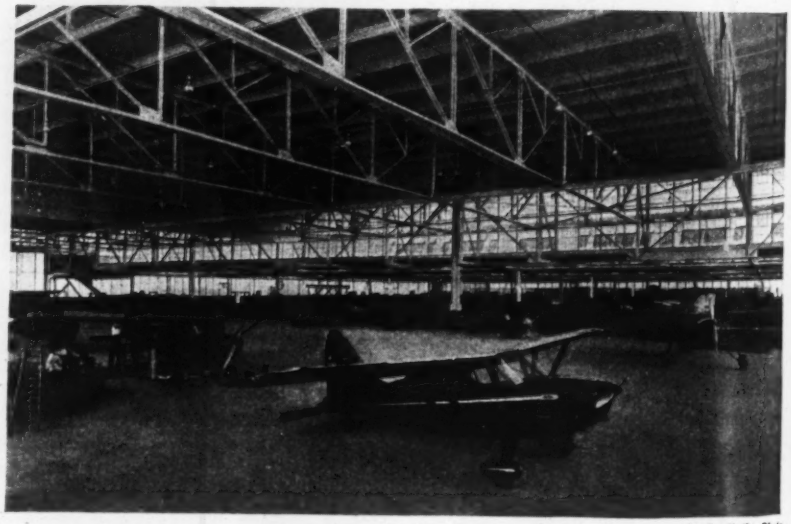
Working with existing government agencies his duties will involve expedition of housing undertaken in connection with defense activities, particularly where plant expansion may create housing shortages. Palmer was organizer and chairman of the executive committee for Techwood Homes in Atlanta, first U. S. slum clearance project. He is at present chairman of the Atlanta Housing Authority and is a past president of the National Association of Building Owners and Managers.

## First major aircraft factory in South completed



*Located on a 36 acre tract adjoining the Nashville, Tenn. airport, a million dollar aircraft manufacturing plant has been completed by the Stinson aircraft division of the Aviation Mfg. Corp., New York City, as the first major aircraft factory ever to be built in the South. Sub-assembly and final assembly of the smaller types of airplanes on a group basis, for which the principal requirements were clear manufacturing space, uniform daylight and flexibility of design to permit economical expansion in either the sub-assembly departments or in the main assembly, were the problems encountered by Albert Kahn, Inc., Detroit, consulting architects and engineers in charge of the work.*

*The new plant consists of a factory building 123,000 sq.ft. in area, an office building covering 20,000 sq.ft., and auxiliary buildings such as paint shop, paint storage house, wood shop and hammer room. All exterior walls of the factory building have glazed steel sash and brick curtain walls with shotcrete spandrel walls between sash and metal roof cornices. Shown in the upper right of the front cover is the administrative building, which houses executive and engineering offices. This building is 42 ft. by 242 ft. in size, is two stories in height, is air conditioned, and has an exterior of brick, with the facade interest depending upon the continuous bands of projected windows.*



*A. C. Kelly Photo*

*In the photos above is shown the assembly department of the factory with an area 125 ft. by 302 ft. The clear height to the under side of the trusses is 24 ft.*

*Rock City Construction Co., Nashville, was the general contractor for the work and M. Marr and Holman, Nashville, were the local architects.*

## Loving to direct army construction work

***Quartermaster general's office sets up civilian organization to aid on cost-plus-fixed-fee contracts***

Harry W. Loving, of Charlotte, N. C., and since 1937 executive secretary of the Carolinas Branch of the Associated General Contractors of America, has been made head of the constructing branch of the construction division, Quartermaster Corps, U.S. Army. Under the direction of Gen. C. D. Hartman, chief, construction division, Office of the Quartermaster General, Loving will be in charge of all defense construction carried out by the War Department on a cost-plus-fixed-fee basis. His staff will consist of 100 or more construction quartermasters stationed at the various army bases where work will be concentrated.

Loving is a graduate of the Georgia School of Technology. With the J. B. McCrary Construction Co., Atlanta, at the opening of the World War, he joined the Army and saw service in France where he was promoted to Major. Rejoining the McCrary firm after the war, he later became a partner in the consulting firm of Totten & Loving, of Atlanta, resigning to join the A.G.C.

### Army consulting board

Francis Blossom, a member of the engineering firm of Sanderson & Porter, New York; Forrest Harvey, of Quinton, Code & Hill-Leeds & Barnard, consulting engineers, Los Angeles; and F. J. C. Dresser, of Cleveland, recently connected with the Public Works Administration as a consultant, have been named to assist Loving in selecting contractors for the Army construction program. The new men are members of what eventually will be a five man construction advisory section in the office of the Quartermaster General. This five-man body will have the duty, on each construction job, of picking from about 1,140 contractors and 320 engineering firms, who have filed applications with the quartermaster general, the three firms best fitted to do the particular job. The quartermaster's office will then negotiate with these three firms, and complete a cost-plus-a-fixed-fee contract with one or more of them.

The advisory section is an outgrowth of a temporary body in existence for several weeks, the Board of Review for Cost-Plus Construction, of which these three men were members.

The board has also engaged in laying the groundwork for rapid expansion of the Army's supervisory and inspection staff to meet the needs of the cost-plus program. These latter plans have been thrown into some uncertainty by a presidential recommendation offered late last week that the expansion be carried out, insofar as possible, through civil service procedure. Congress has authorized the Army to do its hiring outside civil service, and the assumption has been that this power would be used.

*Wide World Photo*

## Harrison gets under way

*W. H. Harrison, vice president and chief engineer of the American Telephone & Telegraph Co., and newly appointed director of the construction division of the National Defense Advisory Commission, is shown at his new desk in Washington, D. C. Harrison, electrical engineer for some years in charge of construction for the AT&T, has the job of seeing that the construction side of the defense program moves forward smoothly, while at the same time causing to a minimum disturbance to normal work. Although details have not been announced, it has already been decided that all major contracts will clear through Harrison's office. As reported in these pages last week, his immediate job will be a survey of the problem to find out what the defense program will demand of the construction industry and, in a general way, what facilities the industry has available to meet the demand.*

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## Bids asked for Battery-Brooklyn Tunnel work

The New York City Tunnel Authority has announced that bids will be opened Aug. 6 for constructing the Brooklyn construction shaft of the Battery-Brooklyn tunnel. This work, estimated to cost about $200,000, will inaugurate actual construction on the project, although approach work is under way by the Triborough Bridge Authority in Brooklyn.

Total cost of the tunnel is placed at $57,000,000, with the city of New York and the Triborough Bridge Authority expected to spend $23,000,000 more for approaches. (*ENR*, March 14, 1940, p. 355).

## Agreement reached in High Point case

The city of High Point, N. C., on July 15 reached an agreement with the Yadkin County commissioners, which it is believed will remove one of the principal obstacles in the way of resuming construction work on the $6,500,000 hydro-electric plant being built on the Yadkin River by the city.

Under the terms of the settlement, the Yadkin commissioners accept the sum of $75,000 in payment for road rights and land for the project. The commissioners also joined with the city of High Point in petitioning the court for relaxation of a restraining order obtained by them which prevents further work on the project. The county will receive an initial sum of $20,000 regardless of whether or not the city is successful in carrying through the project.

The restraining order obtained by the Yadkin commissioners was issued in June 1939 and was one of two which halted work on the dam. This order and another restraining order obtained by High Point taxpayers were granted with the claim that the license obtained from the Federal Power Commission did not permit construction. The restraining orders were upheld by the North Carolina State Supreme Court, the court ruling that the city had no right to condemn public land for the project.

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## Ruling gives draftsmen back overtime pay

As a result of a ruling on classification of employees by George B. Kelly, New York director of the Wage-Hour Division of the U. S. Department of Labor, the Lummus Co. of New York, oil refinery design firm formed in 1930 by the Babcock & Wilcox Co. and the Superheater Co., has paid its draftsmen $13,845 in back overtime wages. By the decision a total of 223 employees get time and a half instead of straight time for overtime put in since October, 1938. The men involved are checkers and designers who do drafting work under supervision and had been carried by the company, on advice of counsel, as professional men exempt from the provisions of the Fair Labor Standards Act. The company, which had been paying time and a half to tracers and junior draftsmen, accepted the ruling and has reclassified this other group of employees.

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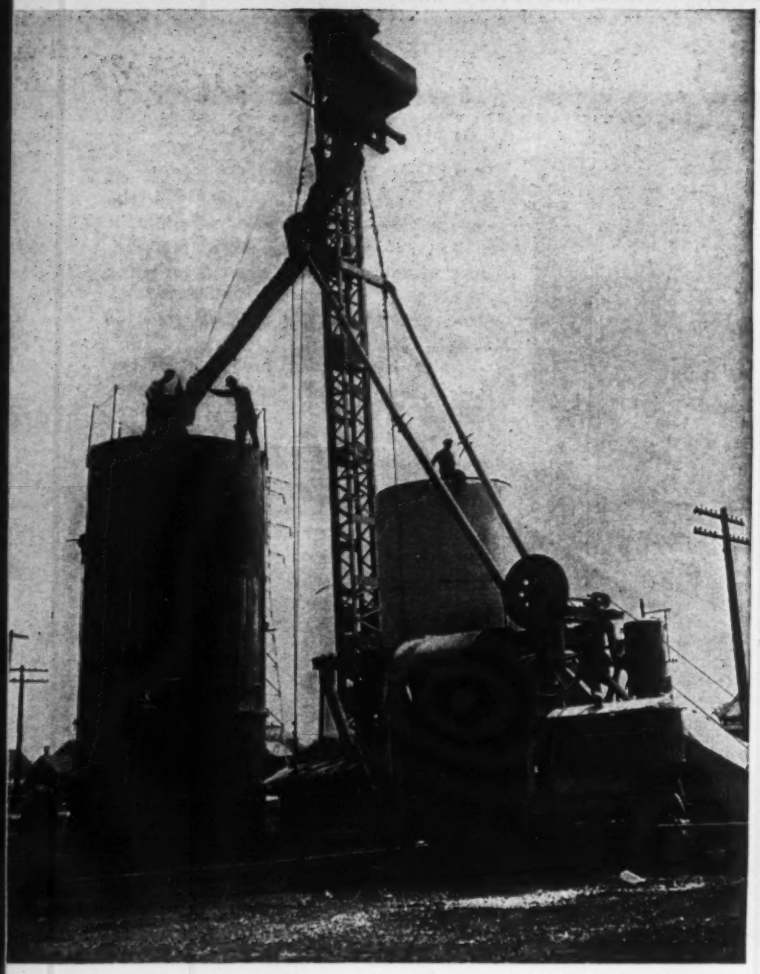
## Boulder storage greater

The storage capacity of Lake Mead behind Boulder Dam is now placed at 32,360,000 acre-feet or 1,860,000 acre-feet more than the original 30,500,000 acre-foot estimate.



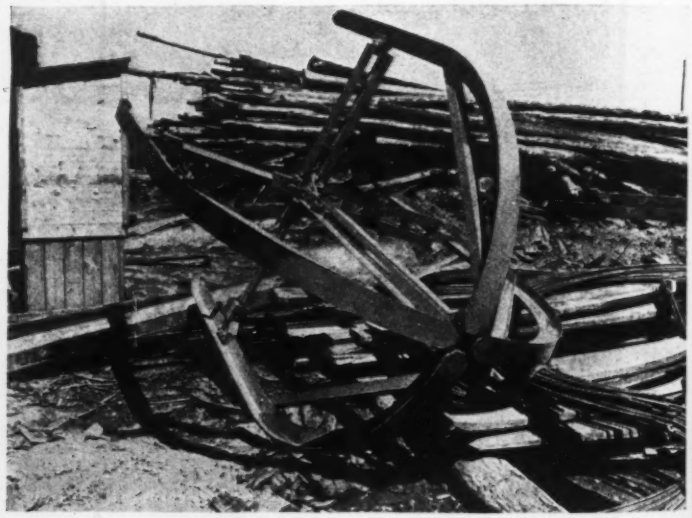
# Obtaining Lake Eri

IN ORDER to abandon the Maumee River supply the city of Toledo, Ohio, is spending $9,000,000 to make water from Lake Erie available. The project is now about one-third complete and work is under way on nearly all of the thirty contracts. Construction includes an intake; a 2½-mile 108-in. underwater concrete pipeline from the intake to the shore; a 4000-ft. tunnel under a sportsman duck swamp; a low-service pumping station; a 9-mile 78-in. steel pipeline to the 80-mgd treatment plant being constructed; a high-service pumping station; a 2-mile 72-in. pipeline to connect with a tunnel under the Maumee River; and extension of the present distribution system for the city.

Work on the intake structure is being prosecuted within a steel sheet pile cofferdam. A barge and a lake steamer sunk to the comparatively shallow bottom (20 ft.) and resting against a row of pile clusters form a breakwater for a harbor at the intake site. Located on the barge and steamer are much of the necessary materials and equipment for the work. The concrete plant is mounted on the crib cofferdam.

The trench for the 108-in. concrete pipeline leading to the shore is excavated with an 8-yd. dipper dredge; a derrick equipped with a full revolving floating crane of

*PLACING CONCRETE in the forms for the 108-in. subaqueous pipe using a paving mixer carrying an elevated mast. The outside shell of the forms is equipped with electric vibrators.*



*PIPE PILOT for guiding sections of the 108-in. subaqueous concrete pipe into place. A toggle at the center of the pilot is released to collapse it after the pipe has been guided into the bell end of the pipe already laid.*

*TEMPLATE for driving sheet piles for the cellular cofferdam at the intake site is shown at left after it has been brought into shore. The intake is being constructed 2½ mi. farther out in the lake.*

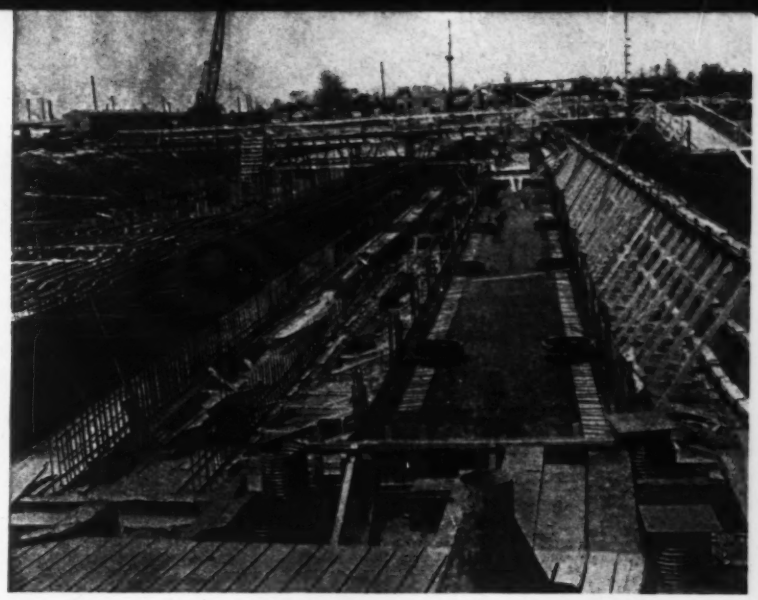
# Erie water for Toledo

50 tons capacity and 90-ft. boom is used for cleaning up the bottom of the trench and setting blocking for the pipe. A third derrick boat, equipped with a 30-ton derrick having a 92-ft. boom and a 150-ton A-frame mounted on the bow, places the pipe in 48-ft. sections. Two 110 x 32 x 10 ft. wood barges are used to transport the pipe sections from the dock to the place required. A 300-yd. dump scow with adjustable gates backfills around the pipe sections when in place.

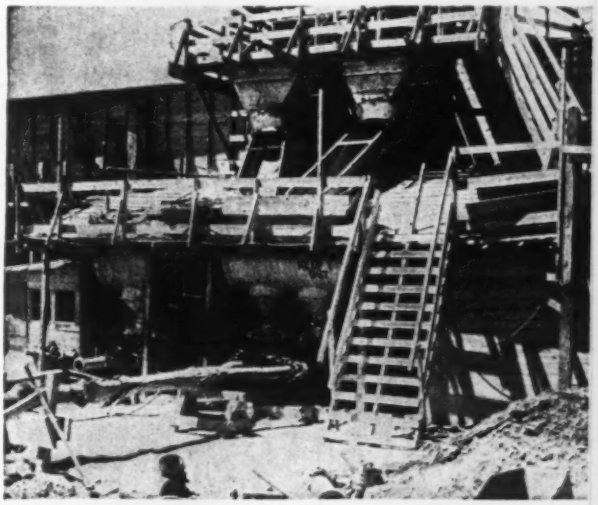
Built through stiff clay, the 4000-ft. tunnel is now 80 per cent complete; the low-service pumping station at the land end of the tunnel is barely started; the steel pipe-lines, aggregating about 20 miles of 42- to 78-in. sizes is 70 per cent laid, and the tunnel under the Maumee River is complete.

As shown by the photographs at upper right, work on the filter plant is well advanced as is construction of the filtered-water basin shown at bottom right.

The new waterworks system is being built under the jurisdiction of George N. Schoonmaker, city manager, with Wm. G. Clark in general charge of construction. W. R. Furman is commissioner of water. For Greeley & Hansen, Chicago, consultants for the work, L. G. Williams is resident engineer.

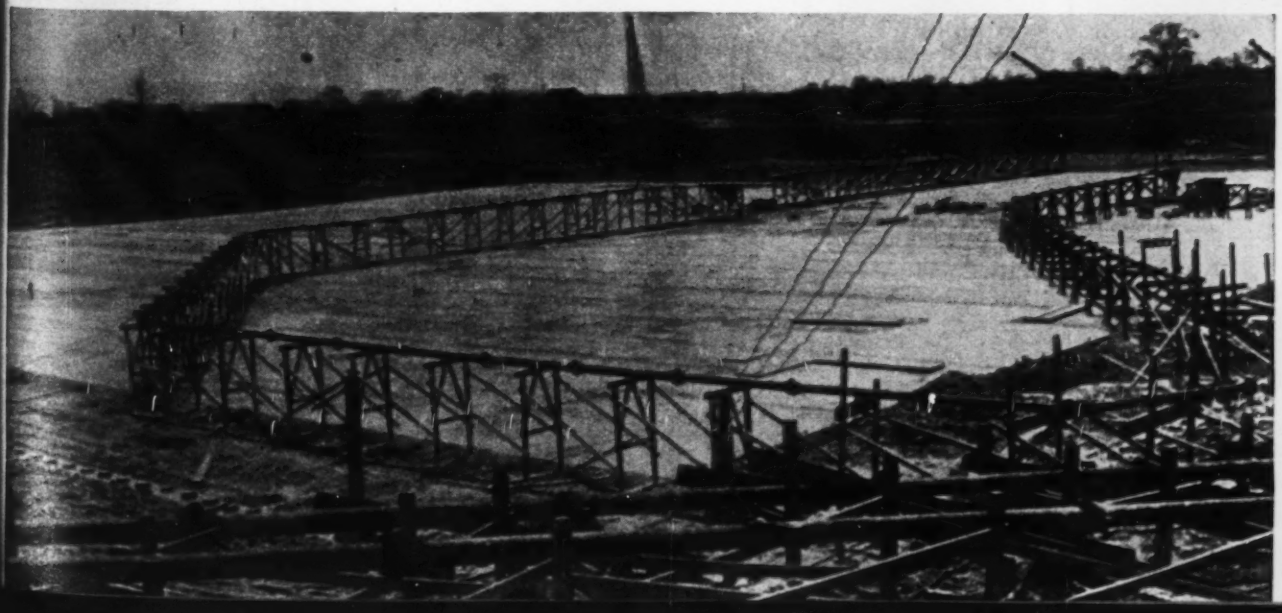


*CONSTRUCTION of main pipe gallery between two banks of filters is shown above with filter drain castings lying on the forms for the roof of the drain conduit. Forms for filtered-water conduit are at right and at extreme left is forming for a filter floor. Staging in the background carries the pipe transporting concrete over the cross gallery between banks of filters.*



*CONCRETE MIXING layout for purification plant includes two 1-yd. mixers and two concrete pumps. Shown are the latter machines behind which are the mixers. Aggregate is trucked to the mixer hopper via a ramp. Cement is stored until needed in truck trailers at the ground level on the opposite side of the ramp.*

*CONCRETE for a mud mat upon which to lay the floor of the filtered-water basin is transported by pipeline to the point where needed and then distributed with rubber-tired buggies. Because of subsoil conditions this reservoir is located 500 ft. from the treatment plant.*



## Strikes delay work on War Department offices

Although the strike of sand and gravel workers in Washington, D. C., was settled last week (*ENR* July 18, 1940, p. 75), a new walkout of carpenters occurred to delay work on the new Social Security and Railroad Retirement buildings, which are being rushed to completion for occupancy by the War Department and the National Defense Commission. The walkout resulted from disagreement over whether carpenters or the plasterers' helpers shall build sawhorses for plasterers' scaffolds. The AFL Building Trades Department ruled that this was "special scaffolding," therefore, in the light of a 1920 ruling, within the province of the trade concerned, namely, the plasterers. The carpenters, refusing to abide by the decision, struck.

Another jurisdictional dispute on the same job results from the plasterers claiming more than 25 per cent representation in setting acoustical tile. Previously the carpenters received 50 per cent, bricklayers 25 and plasterers 25. The workmen are remaining at their jobs pending settlement of this dispute.

The buildings involved are 6-story and penthouse reinforced-concrete structures located across the street from one another. Each is 540 ft. wide but the Social Security Building is 350 ft. long while the Railroad Retirement Building is only 175 ft. long. McCloskey & Co., Philadelphia, is the contractor, and design and supervision is under the Public Buildings Administration.

## WASHINGTON HIGHLIGHTS

AT WHAT a tremendously accelerated pace construction of shore facilities for the Navy is being carried on is evident from a current report of the Bureau of Yards and Docks. In the fiscal year ended June 30, a total of 705 contracts for $286,930,883 were awarded as compared with the previous high mark of $89,092,725 in the 1918 fiscal year. More than three times as many as in the last war! Of the 705 construction contracts in the last fiscal year, 25 were awarded on a fee basis and totaled $211,729,363, or nearly 75 per cent of the entire year's awards.

PROBABLY the first group to feel the pinch of government priorities will be the users of steam turbines. Production capacity in this field is already loaded up, with orders being placed far in advance, and the Navy expansion program is going to increase the demand for turbines by nearly 5,000,000 hp. over the next thirty months—about two-thirds of the normal utility demand for the same period. This Navy demand arises from ships now on order and is independent of the 70 per cent expansion now before Congress; if that passes it will impose an even greater demand in two or three years. Naval turbines are of a size comparable with many used for utility power plants; a battleship may develop as much as 180,000 hp. The Secretary of the Navy now has legal authority to demand priority for Navy orders. The Defense Commission is now studying the problem and it is admitted that early priority orders are likely.

Whether a shortage of steam turbine production facilities would have repercussions on the availability of water wheels is uncertain. The two types of turbines are quite distinct, but the largest producers — Allis-Chalmers, Newport News and DeLaval—build both types. S. Morgan Smith, Baldwin-Southwark, and Pelton build only water wheels, but might be asked to produce steam equipment in an emergency. At the Bureau of Reclamation, which will be buying 1,250,000 to 1,500,000 hp. of turbines in the next two years, opinion is divided, some officials feeling there is no conflict between the two types, others that real difficulty may arise.

THE CIVIL AERONAUTICS AUTHORITY, effective last week, must be notified of the erection or alteration of structures within three miles of an airport which are more than a fiftieth as high as the distance from the nearest boundary of the airport. This regulation only applies if the airport in question is within ten miles of a civil airway and posseses at least one permanent building and a 2,000-ft. runway or is equipped for night operation. CAA has no power to regulate such structures, but it wants to know about them so that it can warn airplane operators.

Notification should be sent to the CAA in Washington and to the manager of the airfield. All that is required is a simple letter describing and locating the structure and giving the date when the height will exceed a fiftieth of the distance from the field. Failure to comply may involve a $500 fine.

## JOBS OF THE WEEK

**NAVY YARD, Portsmouth, N. H.**

Aberthaw Co., Boston, awarded cost-plus-fee contract for constructing shipway, barracks, building extensions, and accessories. Estimated cost $1,300,000.

**BUILDINGS, Panama Canal**

Robert E. McKee, El Paso, Texas, was awarded a contract by Constructing Quartermaster, Washington, D. C., for $2,271,500, covering engine test building, equipment repair building, airplane repair shop, engine repair shop, and depot supply building at Albrook Field.

**POWER LINE, Ontario**

Canadian Bridge Co., Ltd., Walkerville, will fabricate all steel for the towers of a power line being constructed from Quebec boundary to Leaside, Ont., for the Hydro-Electric Power Commission of Ontario. Total estimated cost $6,000,000.

**RESERVOIR CONTROL WORKS, Fort Supply, Okla.**

Leo Sanders, Oklahoma City, was awarded a $2,920,566 contract by U. S. Engineers for outlet and control works and final closure section at Fort Supply Dam in Northwestern Oklahoma on a tributary of the North Canadian River. The earth dam construction has been carried out by Morrison Knudsen, Inc., and W. E. Cole Co.

**DEPOT SUPPLY BUILDING, Ogden, Utah**

Peter Kiewit Sons Co., Omaha, Neb., awarded an $881,775 contract by Constructing Quartermaster, covering 841 x 441 ft., brick and reinforced concrete depot supply building at Hill Field arsenal and air base. This is part of $10,000,000 improvement at this air field.

**COLLEGE BUILDING, Burlington, Vt.**

Edmund J. Rappoli Co., Inc., Boston, Mass., awarded contract for constructing 3-story, basement, 191 x 265 ft. Waterman Memorial building, for University of Vermont. Estimated cost $1,000,000. McKim, Mead & White, New York, are architects.

**VETERANS HOSPITAL, Marion, Ill.**

Veterans Administration, Washington, D. C., received the lowest bid for building and utilities for the Veterans Hospital from Swenson Construction Company, Kansas City, Mo., $1,623,880. Estimated cost $1,400,000.

NOTE—Additional bidding and contract news on over 600 projects, large and small, appears in the Construction News Section beginning on page 13.

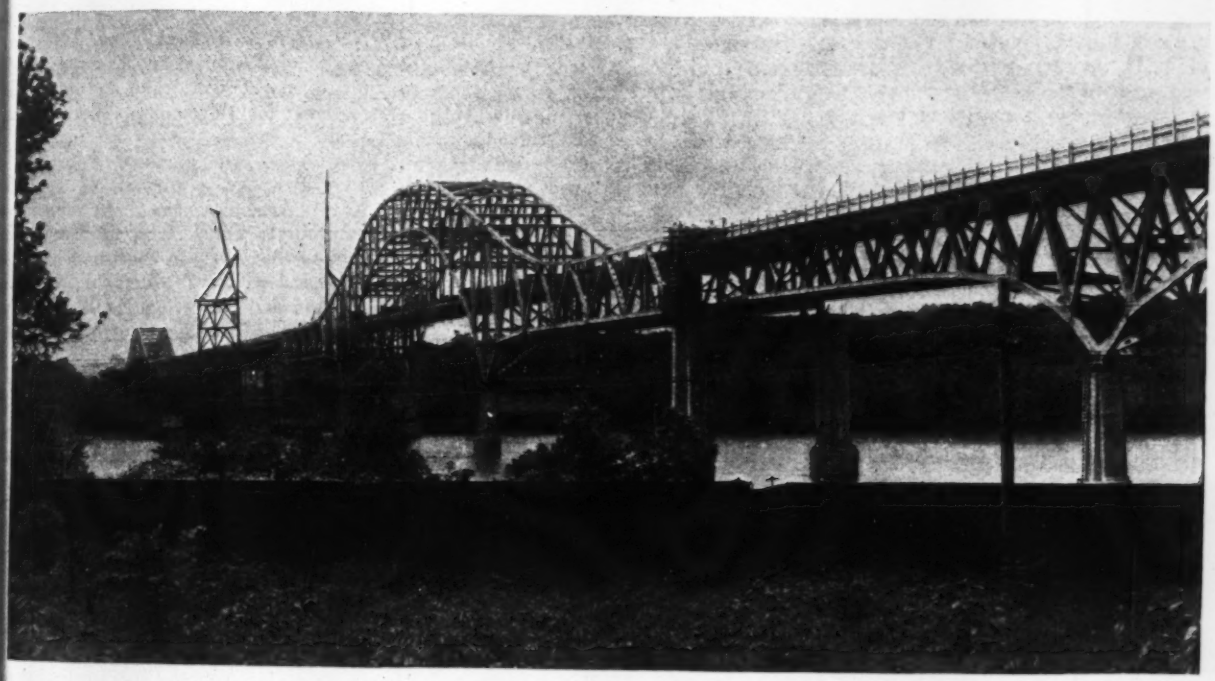
# Many statutes affecting engineers passed in Louisiana

### State board of engineers set up to study flood control, replacing old Flood Control and Water Conservation Commission

The first session of the Louisiana legislature, following the election which routed the forces of the Huey Long machine, produced a number of measures that have engineering significance. Abolition of the Louisiana Flood Control and Water Conservation Commission and the passing of a measure setting up the Louisiana State Board of Engineers to study matters pertaining to flood control, is regarded as one of the most important of the developments sponsored by Governor Jones.

Other measures of interest to engineers and contractors that go into effect as a result of the recently concluded legislative session include the following: change of the act licensing general contractors by prohibiting issuance of proposal forms within 24 hours after receiving bids; an act authorizing municipal corporations to construct revenue producing utilities from funds not otherwise appropriated; appropriation of $1,500,000 for the construction of a bridge over the Calcasieu River at Lake Charles, La.; Act 189 directing the Louisiana State Highway Commission to make a survey of the existing laws with reference to bond issues which have been voted by the parishes (a step toward assumption by the state authority of outstanding bonds, the proceeds of which were used for constructing roads now incorporated in the state highway system); Act 231 authorizing municipalities of more than 12,500 population to install parking meters; and Act 144 endorsing the route sponsored by the Louisiana-Natchez State Parkway Association for the extension of the parkway across the state from Vidalia, where the new Natchez Bridge across the Mississippi is nearing completion, to Pendleton.

Also passed was an act refunding $2,000,000 from the public school fund to the highway commission fund, as was an act providing for the Louisiana State Highway Commission to receive a refund of revenues lost through reduction of passenger motor vehicles revenues. This latter action will be possible by the transfer to the commission of an existing one-cent-per-gallon gasoline tax now going to the parishes. Contractors will be permitted to use out of state trucks for hauling road materials and load limits on trucks using the highways are increased to 12,000 lb. and that for truck trailers to 20,000 lb. by the terms of other measures.



## Havre de Grace bridge nears completion

*Providing four lanes of traffic, two each way, a $2,500,000 toll highway bridge is nearing completion across the Susquehanna River at Havre de Grace, Md. Built by the Maryland State Roads Commission, the structure is 7,600 ft. long, including two 456 ft. arch spans, and replaces an inadequate double deck highway bridge on U. S. Highway 40.*

*All of the truss and girder spans, totaling 49 in all, employ pinned Wichert rhomboid panels over the piers. The arches and side spans were erected by balanced cantilever methods from the main channel piers with the aid of a single falsework bent under each anchor arm, erection being advanced by progressive stages on the arch and the side spans to limit reaction of each chord to about 300 kips at the falsework bent.*

*Robert C. Reitz, contractor of Lancaster, Pa., held the original contract for the substructure work, but during the summer of 1939 it was necessary for the bonding company to take over the work with the McLean Contracting Co. of Baltimore completing the remaining portion of that contract. Elmer J. White was superintendent for both the Reitz and McLean firms. The structural contract was performed by the Bethlehem Steel Co. with G. C. Land, resident engineer. J. E. Greiner Co., consulting firm of Baltimore, was retained by the State Roads Commission to perform all engineering work on this contract. E. Russell Allen of the Greiner Company was in charge of the project, with B. W. LeSueur as resident engineer.*

*Total cost of the work, including construction, right-of-ways, legal, and engineering, costs, is about $4,727,000. The work was financed by a bond issue and a PWA grant.*

# MEN AND JOBS

CHARLES R. PODAS, formerly associated with the design division of the Pennsylvania Turnpike Commission of Harrisburg, Pa., is now with the firm of Ralph D. Thomas & Associates, consulting engineers of Minneapolis. Previous to his work with the Turnpike Commission, he was associated with the Minnesota State Highway Department and the Park Commission of the city of Minneapolis. He attended the University of Minnesota.

J. GORDON LEE, general contractor of New Orleans, has been named a member of the New Orleans Housing Authority to succeed HAMPTON REYNOLDS, resigned. Lee was associated with the O. M. Gwin Construction Co., New Orleans contracting firm, as manager from 1919 to 1937. Since then he has headed his own company.

LLOYD MCNULTY, assistant city engineer of St. Paul, Minn., for some years, has been appointed acting city engineer to serve for the remainder of the term of W. H. CROPSEY, former city engineer who has been made superintendent of the new sewage disposal plant of that city.

JED HARTINGER, Republican nominee for engineer of Meigs County, Ohio, has been appointed to that position by the county commissioners to fill out the unexpired term of THEODORE BEEGLE, who has resigned to accept a position with the Ohio State Highway Department. Hartinger held the county position from 1925 to 1933.

M. N. TOBIAS, of Biloxi, Miss., area engineer for the WPA in Harrison, Stone, George and Jackson counties, has been transferred to Jackson, Miss., where he will succeed P. A. O'BRIEN as assistant director of WPA operations. The new duties of O'Brien are WPA field engineer.

HENLEY S. EDEN, Camp Hill, Pa., has begun new duties as assistant director of WPA engineering operations in Pennsylvania, according to State WPA Administrator PHILIP MATHEWS. Eden, who has been with the WPA engineering department since 1937, will have the duties of a newly-created position in his new job.

JAMES L. EDWARDS and LAWRENCE R. HJORTH, formerly associated with H. G. Balcom Associates, New York City, have opened offices in New York City for practice under the firm name of Edwards and Hjorth. GEORGE A. SALLANS and SHERMAN A. CALLAHAN, also former members of the Balcom firm, which is now being dissolved, are to practice in New York under the firm name of Sallans and Callahan. Also A. J. WILCOX, another member of the Balcom organization, has opened offices with A. M. ERICKSON, consulting engineer, to practice under the firm name of Wilcox and Erickson.

J. B. BISHOP, engineering graduate of the University of Kentucky, recently began new duties as city engineer and superintendent of public works at Elizabethtown, Ky. Bishop once was connected with the War Department as inspector and for a time worked with the Southern Ry. in the signal and electrical department.

STEPHEN H. DEMING has begun new duties as city engineer of Columbia, Mo., succeeding W. B. Cauthorn, who died recently.

STEPHEN P. TIMOSHENKO, professor of theoretical and applied mechanics of Stanford University, is among those to teach at the Graduate Institute of the Armour Institute of Technology this summer. Other instructors will include: JOHN R. BAYLISS, physical chemist in charge of the city of Chicago's experimental filtration plant, and FLOYD W. MOHLMAN, director of laboratories, Sanitary District of Chicago.

WILLIAM A. BRENNAN last month retired as commissioner of public safety for the city of White Plains, N. Y. From 1926 to 1937 Brennan served as deputy commissioner. Previous to that he was employed by the New York Central R. R. in charge of surveys and laying out substructures of buildings over the Grand Central Terminal tracks in New York City.

PERRY FORD, secretary of the Ohio State Board of Examiners for Professional Engineers, was recently made an honorary member of the Societe des Ingenieurs Professionnels of France. Ford, a graduate of Ohio Northern University, once served as county engineer of Putnam County, Ohio. He organized the Northwestern Ohio County Engineers' Association. He has served as vice-president of the national council of state boards of engineering examiners and as president of the National Society of Professional Engineers.

CAPT. LEE B. WASHBOURNE, executive officer of the Little Rock district, U. S. Engineers, has been transferred to McDill Field, Fla., to do duty with the 21st Engineers on a new army airbase now under construction near Tampa. He will be succeeded at Little Rock by CAPT. JOHN R. CRUME, former instructor at the West Point Military Academy, who went to Little Rock July 5.

JOHN B. YOUNGBLOOD, consulting engineer for the Ohio state welfare department, July 1 retired after 30 years of service with the state of Ohio. He will make his home in the country near Columbus.

LIEUT. JOSEPH L. JOHNSON, engineer with the Little Rock division, U. S. Engineers, has been transferred to the 28th Engineers at March Field near Riverside, Calif. Before the transfer, Lieut. Johnson was directing exploration and supervising construction on the Norfolk Dam. Lieut. Johnson did post graduate work at the Massachusetts Institute of Technology following graduation from the U. S. Military Academy in 1934. He joined the Little Rock office in 1938.

LIEUT. CMDR. DOW H. NICHOLSON, civil engineering corps, U. S. Navy, has been detached from duty at the Philadelphia Navy Yard to replace CMDR. AIBERT A. BAKER, civil engineering corps, as inspector of naval petroleum and oil shale reserves for Wyoming, Colorado and Utah.

J. A. BENTLEY, a graduate of the U. S. Naval Academy, has been appointed assistant to CMDR. CARL H. COTTER in Jacksonville, Fla., on construction of the Southeastern Naval Air Base in Duval, Brevard and Dade counties. Bentley is a graduate of Rensselaer Polytechnic Institute.

LIEUT. CMDR. GEORGE R. BROOKS, civil engineering corps, U. S. Navy, has been detached from duty in the 11th Naval District and transferred to the 15th Naval District. Cmdr. Brooks was public works project manager for the Naval Supply Depot and the Destroyer Base in the San Diego region.

HAROLD D. CAVIN, former resident engineer for the Hardy S. Ferguson Co., New York, on construction of a paper mill for Hollingsworth & Whitney Co., Mobile, Ala., has begun new duties as consulting engineer for the Puget Sound Pulp & Timber Co.

VICTOR MCCORMICK, Lincoln, Neb., has been appointed city engineer of Atlantic, Iowa, to succeed HOWARD WILLIAMS.

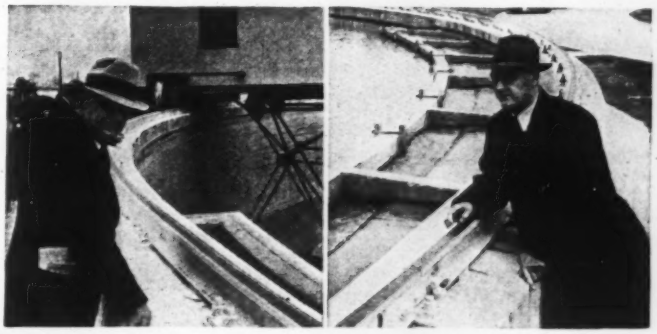
LIEUT. JAMES R. DAVIS, civil engineering corps, U. S. Navy, has been ordered detached from duty at the Naval Operating Base, San Diego, Cal., to do duty in the 16th Naval District, Cavite, P. I.

# MEN AT WORK

*Well known among engineers in Wyoming are (left to right below): J. R. CARR, bridge section, Wyoming State Highway Department; C. E. OKERBERG, construction superintendent with Edw. Selander, contractor of Greeley, Colo.; J. R. BROMLEY, resident engineer, highway department; R. C. PIKE, project engineer, highway department; and E. L. HALEY, division engineer, Chicago, Burlington & Quincy R. R. They are standing on a viaduct built by the highway department to carry Yellowstone Highway over C. B. & Q. tracks at Greybull, Wyo.*

*One of the four new 2-mg water supply reservoirs for the city of Rock Island, Ill., gets the approval of CARL H. REXINE (above standing), resident engineer, Federal Engineering Co., Davenport, Iowa, and H. A. McINTOSH, superintendent of all construction, Priester Construction Co., Davenport.*

*More "at ease" than "at work," the critical may designate these two, CHARLES B. BURDICK (left), member of Alvord, Burdick & Howson, consulting engineers of Chicago, and R. W. FURMAN, commissioner of water at Toledo, Ohio. They are shown inspecting clarifiers of the Kansas City, Mo., waterworks during the recent A. W. W. A. convention in that city.*



*One of the problems in carrying out a $2,850,000 improvement of San Francisco's municipal airport is the fill work. M. B. SWEET (left above), superintendent of airport maintenance; GEORGE D. BURR (center), assistant engineer in charge of design, and B. M. DOOLIN, airport superintendent, are caught examining old shell deposits as a possible source of supply for fill material.*

*Among the engineers responsible for construction of the new $700,000 water plant placed in operation last month at Raleigh, N. C. are, left to right below, J. R. COOK, resident engineer for the city; JIM HORTON, plant engineer; and ROY L. WILLIAMSON, commissioner of public works. Additional information about Raleigh's new plant is given in ENR July 11, 1940, p. 63.*

### Trophy for a Waterworks

*A trophy of Monel metal has been made by inmates of the Illinois State Penitentiary at Menard for presentation to the Illinois Department of Public Health for award to the Illinois waterworks making the greatest contribution in the waterworks field during 1940. Many inmates of the penitentiary have shown great interest in the treatment of water and the afternoon session of the Southern and Central Illinois Water Works operators conference was held in the penitentiary's recreation assembly May 15.*

## OBITUARY

DAVID M. OLTARSH, civil engineer and builder who organized and became president of David M. Oltarsh, Inc., New York, in 1928, died July 21 in New York City at the age of 57. Following graduation from City College of New York, Oltarsh was employed by the Oltarsh Iron Works until 1912. From then until the United States entered the World War, he was with the Brady-Oltarsh Construction Co. During the war he served with the 28th Engineers, and after the war with the 438th and the 401st Engineers, being promoted to major and then lieutenant-colonel.

PAUL CARL HELLER, civil engineer of Picayune, Miss., died in that city last week at the age of 66.

WILLIAM B. OSTERHOUT, 85, civil engineer who retired in 1938 after 50 years of service with various New York City departments, died in Freeport, L. I., July 18. Following graduation from the U. S. Naval Academy in 1876, he spent several years in the West with the Northern Pacific R.R. Later he joined Robert Ridgway building the Croton reservoir for the New York water supply system.

ALFRED MARKHAM, 72, owner of A. Markham & Co., building contractors of Louisville, Ky., died July 18.

RICHARD E. KRIESIEN, 69, civil engineer with the New York Central R.R. for 44 years, died July 18 in Cleveland.

WILLIAM E. ROLFE, 66, who served for 20 years as assistant to the president of the board of public service at St. Louis, died July 15 at St. Louis. Rolfe, a civil engineer, spent 38 years in the employ of the city of St. Louis. He graduated from Washington University in 1895 and soon afterward entered the employ of the St. Louis water department as third assistant engineer. Since 1938 he has been associated with L. Roy Bowen & Associates.

GEORGE C. BROWN, former assistant maintenance engineer for the Michigan State Highway Department, died at his home in Lansing July 15. Since 1933 he had been consulting engineer for the Jensen Bridge & Supply Co., Sandusky, Mich.

## CONTRACTS AND CAPITAL

ENGINEERING CONSTRUCTION awards for the week total $52,380,000, an increase of 24 per cent over the corresponding 1939 week, but 69 per cent below the record volume of a week ago. Private awards are 35 per cent above last year, but fall 8 per cent below last week. Public construction tops the 1939 week by 21 per cent but is 75 per cent below the high volume of the preceding week.

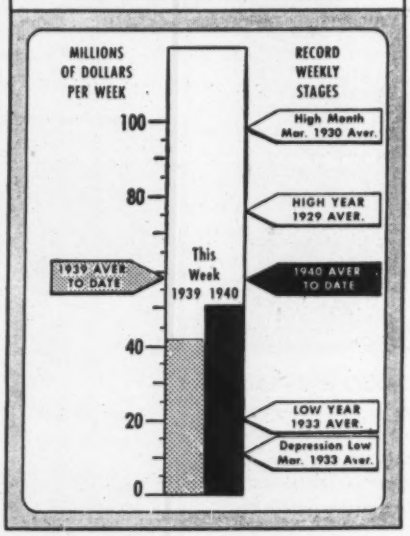
Three consecutive weekly gains over 1939 values bring 1940 construction to $1,742,468,000, practically even with the $1,744,693,000 reported for the 30-week period last year. Private awards, $552,794,000, are 26 per cent higher than a year ago. Public construction, $1,189,674,000, is 9 per cent below the level of last year, in spite of a 125 per cent increase in federal work.

In the classified construction groups gains over the preceding week are in commercial building and large-scale private housing, earthwork and drainage, and streets and roads. Increases over the week last year are in bridges, public buildings, and earthwork and drainage.

New capital for construction purposes for the week totals $22,631,000, an increase of 19 per cent over the volume for the corresponding 1939 week. The week's financing is made up of $18,651,000 in corporate security issues, $2,897,000 in state and municipal bonds, and $1,083,000 in RFC loans for public improvements.

New construction financing for the year to date, $1,689,806,000, is 5 per cent below the $1,769,120,000 reported for the 30-week period last year.

**ENR CONSTRUCTION VOLUME**




### CONTRACTS

(Thousands of dollars)

| | Week Ending July 27 1939 | July 18 1940 | July 2 19 |
|---|---|---|---|
| Federal | $6,529 | $130,736 | $13,0 |
| State & Municipal | 26,150 | 26,205 | 24,2 |
| Total public | $32,679 | $156,941 | $38,0 |
| Total private | 9,455 | 13,893 | 12,7 |
| TOTALS | $42,134 | $170,834 | $52,7 |
| Cumulative | | | |
| 1940 (30 weeks) | | | $1,742,4 |
| 1939 (30 weeks) | | | $1,744,0 |

Note: Minimum size projects include are: Waterworks and waterways projects $15,000; other public works, $25,000; industrial building, $40,000; other buildings $150,000.

### NEW PRODUCTIVE CAPITAL

| | 1939 30 Wks. | Cumulative 19 30 Wk |
|---|---|---|
| NON-FEDERAL | $947,593 | $916,2 |
| Corp. Securities | 141,201 | 110,9 |
| State & Mun. | 377,109 | 526,9 |
| R.E.A. loans | 89,445 | |
| U.S.H.A. loans | 146,419 | 87,2 |
| R.F.C. loans | 3,419 | 8,0 |
| Fed Aid-Hdy | 190,000 | 184,0 |
| FEDERAL | $821,527 | $783,2 |
| Total Capital | $1,769,120 | $1,699,4 |

### FHA MORTGAGES

| | Week Ending July 22 1939 | July 13 1940 | July 2 19 |
|---|---|---|---|
| Selected for appraisal | $21,401 | $27,883 | $26,3 |
| Cumulative | | | |
| 1940 (29 weeks) | | | $712,3 |
| 1939 (29 weeks) | | | $660,5 |

* Subject to revision.

### ENR INDEX NUMBERS

| | | | |
|---|---|---|---|
| Index Base = 100 | | 1913 | 2 |
| Construction Cost | July '40 | 242.15 | 1 |
| Building Cost | July '40 | 291.68 | 1 |
| Volume | June '40 | 225 | |

## BRIEF NEWS

DIRECTORS of the Canadian National Ry. are not planning to stop construction on the Montreal terminal due to the European war situation, according to S. J. Hungerford, chairman of the board. In telling of the work Hungerford stated that the total cost of the terminal would be $28,650,000, of which $22,675,000 had already been spent or was under contract.

THE OHIO Department of Highways plans an Ohio Road Show at the Ohio State Fair Aug. 24-30.

VAIL PASS is the name given to a new mountain highway pass now under construction over the Gore range between Wheeler and Dowd, Colo., in honor of Charles D. Vail, Colorado state highway engineer. Gov. Carr of Colorado has given approval to the request, which was made by the board of commissioners of Eagle County.

BILLBOARDS will not be permitted along the Pennsylvania Turnpike, according to Walter A. Jones, chairman of the Pennsylvania Turnpike Commission. The most recent report is that the 160-mile express highway will be dedicated Labor Day.

FOUR HUNDRED Illinois school bus operators will attend classes for one week beginning Aug. 6 when the Illinois State Highway Division begins checking equipment used to transport children to schools throughout the state. Instruction in safe driving and traffic laws will be given by safety officials and traffic engineers.

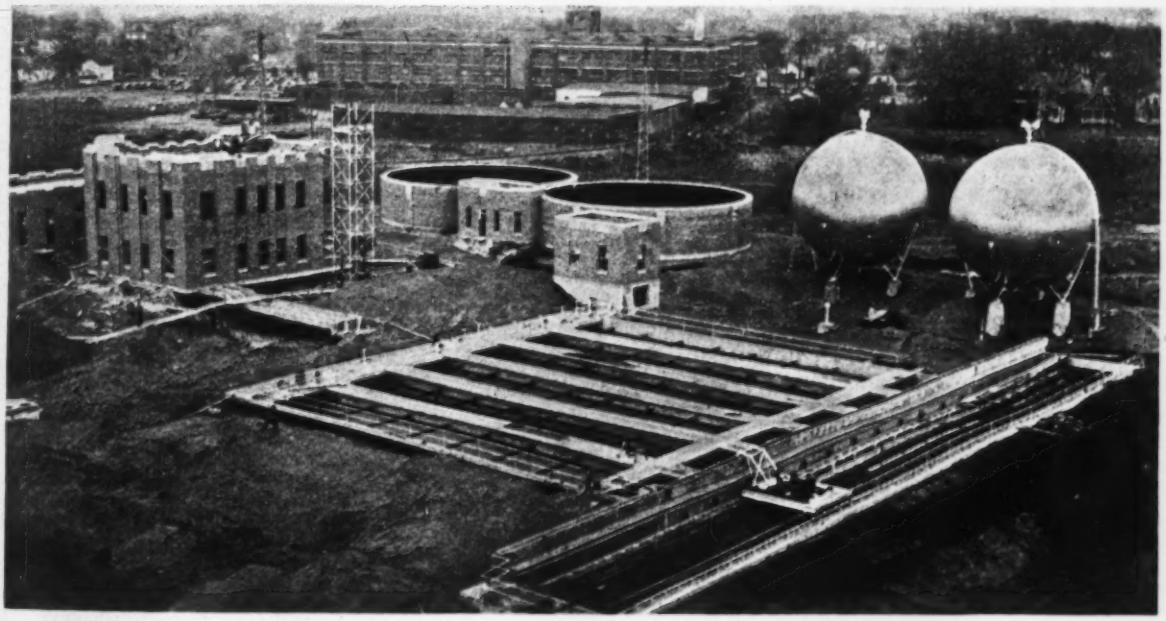
A DECREASE of 11 per cent in motor vehicle deaths on the streets and highways of Ohio during the 15-month period from Jan. 1, 1939 to April 1, 1940, has been reported by Robert S. Beightler, director of the Ohio highway department.

THE CITY of Philadelphia has developed a new code that requires all plans for certain types of buildings to carry the seal and signature of a registered architect or engineer. The new Philadelphia regulations, which became effective July 15, specify that row and semi-detached dwellings are exempt, as well as detached houses not over two stories and not exceeding $10,000 in cost. Exemptions are also allowed for garages not larger than three-car capacity and certain types of alterations.

• • •

### University of Illinois graduates well employed

A canvass of the civil engineering graduates of the University of Illinois for the 17-year period 1923 to 1939, inclusive, just made by Prof. W. C. Huntington, shows an employment of 99.2 per cent. Out of 642 returns, 598 or 93.1 per cent reported that the graduate is engaged in engineering work, while 6.1 per cent are in non-engineering work. The largest group is in private engineering (43.7 per cent), while 23.1 per cent and 17.5 per cent are in federal and state engineering work, respectively. Incomplete data on 1940 graduates indicate that employment at present is better than for some years.



### Rock Island's new sewage system dedicated

*Started nearly two years ago, a new $3,000,000 sewage disposal system, including the above treatment plant and a modernized sewer system, was dedicated at Rock Island, Ill. on July 11. Municipal wastes of all kinds will be treated at the new plant, which provides for treatment of sewage by primary sedimentation followed by magnetite sand filtration, and for the grinding of garbage and the burning of sludge and trash. Sludge gas will be stored in the two spherical tanks shown to provide fuel for operating the plant.*

*The work was done as a PWA project under the supervision of the Chicago office of PWA with E. R. Kennicott regional director and John T. Ward, Jr., in charge of field supervision. Consoer, Townsend & Quinlan, Chicago, were consultants for the work with Eugene Hardin in charge of treatment plant design, George Consoer in charge of sewer design, and George W. Brunkhorst and Richard Cook as construction engineers.*

*Contractors for the sewer work included: E. M. Rocho, Freeport, Ill.; Drainage Construction Co., Detroit, Mich.; McCarthy Improvement Co., Davenport, Iowa; Keeler & Phelan, Davenport, Iowa; G. J. Gjellefald Construction Co., Forest City, Iowa, and Dan Christiansen Construction Co., Cedar Rapids, Iowa.*

*The sewage treatment plant was built by the Stark Construction Co., Cedar Rapids, Iowa.*

*Design and construction details will be published in an early issue of Engineering News Record.*

# CONTRACT UNIT PRICES

**What contractors are bidding on different kinds of construction work**

## BIRCH HILL DAM
## MASSACHUSETTS

OWNER: U. S. Engineer Office, Providence, R. I.

PROJECT: Construction of Birch Hill Dam, a unit in the Connecticut River Valley Flood Control system, located on Millers River 1.3 miles northeast of South Royalston, Worcester County, Mass. Involves construction of outlet works consisting of approach channel, gate structure in concrete lined rock cut, operating house, outlet channel, and installation of gates and equipment; diversion and care of river; rolled earth fill dam with impervious core, random and pervious outer shells, dumped rock fill slopes and upstream impervious blanket; three ogee section concrete spillway weirs; access road and bridge, and road across dam.

CONDITIONS: Rail transportation facilities available to South Royalston. Highway also available on which traffic must be maintained during first construction season. Project to be completed in 550 calendar days. Government to furnish service gates complete, emergency gate, four sets of conduit linings and bronze plaque. Contractor to furnish balance of materials. Wage rates stipulated are: skilled labor, 90c. to $1.50; semi-skilled, 65 to 87½c.; and unskilled, 50c. per hr.

LIST OF BIDDERS: (April 3, 1940)

1. B. Perini & Sons, Inc., Framingham, Mass. (contract) . $535,829
2. Carlo Bianchi & Co., Inc., Framingham, Mass. . . . . 542,793
3. John Arborio, Inc., Poughkeepsie, N. Y. . . . . 561,948
4. Elmhurst Contracting Co., Inc., Long Island City, N. Y. . 564,191
5. Geo. M. Brewster & Son, Inc., Bogota, N. J. . . . . 573,730
6. David W. Johnson, Inc., Newark, N. J. . . . . 585,146
7. C. & R. Construction Co., Roslindale, Mass. . . . . 585,222
8. A. I. Savin Constr. Co., East Hartford, Conn. . . . . 590,844
9. J. T. McCarthy Co., Davenport, Iowa . . . . . 599,690
10. John J. McHale & Sons, Inc., Pawtucket, R. I. . . . . 636,085
11. V. Barletta Co., Roslindale, Mass. . . . . 650,254
12. John Iafolla Constr. Co., Dedham, Mass. . . . . 656,172
13. S. J. Groves & Sons Co., Ridgefield, N. J. . . . . 667,453
14. W. H. Hinman, Inc., North Anson, Me. . . . . 687,052
15. J. F. Fitzgerald Constr. Co., Boston, Mass. . . . . 708,341
16. Bronx Water Works Corp., Bronx, N. Y., and DeBlasio Constr. Corp., New York, N. Y. . . . . 773,388

| Item | Quan. | Unit Prices (1) | (2) | (3) |
|---|---|---|---|---|
| 1. Diversion and care of river | L.S. | $6,900.00 | $5,000.00 | $15,000.00 |
| 2. Clear and grub | L.S. | 5,000.00 | 15,000.00 | 35,000.00 |
| 3. Common stripping | 37,700 c. y. | .40 | .20 | .50 |
| 4. Common excav., general | 162,000 c. y. | .30 | .20 | .20 |
| 5. Common excav., access road | 2,500 c. y. | .30 | .30 | .20 |
| 6. Com. excav., access rd. struct. | 400 c. y. | 3.50 | 2.50 | 1.00 |
| 7. Com. excav., cut-off trench | 6,500 c. y. | .50 | .35 | .40 |
| 8. Com. excav., borrow area A | 140,000 c. y. | .25 | .20 | .20 |
| 9. Com. excav., bor. area access rd. | 13,000 c. y. | .25 | .30 | .30 |
| 10. Com. excav., from stockpiles | 55,000 c. y. | .25 | .15 | .25 |
| 11. Rock excavation | 58,000 c. y. | 1.25 | 1.50 | 1.20 |
| 12. Line drill and broach | 18,200 s. f. | .50 | 1.80 | .50 |
| 13. Select. impervious fill | 65,000 c. y. | .15 | .20 | .10 |
| 14. Impervious blanket fill | 28,000 c y. | .12 | .10 | .10 |
| 15. Random fill | 73,600 c. y. | .15 | .10 | .10 |
| 16. Pervious fill | 78,400 c. y. | .15 | .10 | .10 |
| 17. Gravel bedding | 3,000 c. y. | 1.00 | 1.00 | .75 |
| 18. Fill (uncl.), access rd. | 14,500 c. y. | .15 | .10 | .05 |
| 19. Compacted backfill | 1,000 c. y. | 1.00 | 2.00 | .50 |
| 20. Semi-compact. backfill | 5,600 c. y. | .30 | .20 | .30 |
| 21. Gravel for roads | 2,000 c. y. | 1.30 | 1.00 | 1.00 |
| 22. Dumped rock fill | 38,000 c. y. | .50 | .75 | .40 |
| 23. Hand-placed riprap | 3,000 c. y. | 2.50 | 3.00 | 6.00 |
| 24. Grouted stone gutters | 350 s. y. | 2.50 | 3.50 | 2.00 |
| 25. Gravel filled drains | 1,000 l. f. | .60 | 2.00 | 1.00 |
| 26. 12-in. corr. met. pipe | 54 l. f. | 2.50 | 2.00 | 2.00 |
| 27. Core or rotary drills; rock, conc. | 1,300 l. f. | 3.50 | 4.00 | 3.00 |
| 28. Ordinary drilling | 850 l. f. | 1.00 | 1.00 | .60 |
| 29. Pressure grouting | 1,300 c. f. | 1.25 | .50 | 1.50 |
| 30. Portland cement | 17,600 bbl. | 2.75 | 2.40 | 2.50 |
| 31. Cl. A conc., channel lining, gate str. | 2,040 c. y | 15.00 | 16.00 | 15.00 |
| 32. Cl. B conc., outlet wks., ret. walls | 390 c. y. | 10.00 | 12.00 | 12.00 |
| 33. Cl. A conc., rd. and bridge struct. | 170 c. y. | 25.00 | 17.00 | 15.00 |
| 34. Cl. B. conc., spillway weir | 12,200 c. y. | 7.50 | 7.25 | 9.00 |
| 35. Reinforcing steel | 164,000 lb. | .045 | .05 | .05 |
| 36. Oper. house superstr. | L.S. | 15,000.00 | 13,000.00 | 15,000.00 |
| 37. Misc. struct. steel | 9,000 lb. | .20 | .12 | .10 |
| 38. Misc. iron and steel | 6,700 lb. | .20 | 15 | |
| 39. Misc. wr. iron pipe | 5,800 lb. | .20 | 25 | |
| 40. Misc. black steel pipe | 3,800 lb. | .12 | 12 | |
| 41. Misc. brass and bronze | 50 lb. | 1.50 | 00 | |
| 42. Copper water stops | 160 lb. | .80 | 00 | |
| 43. Lighting and power | L.S. | 4,000.00 | 4,500 00 | |
| 44. Install gates and accessories | 200,000 lb. | .02 | 015 | |
| 45. Install conduit linings | 126,000 lb. | .02 | 02 | |
| 46. Furn. and install crane | L.S. | 4,500.00 | 4,000 00 | |
| 47. Gasoline-elec. stand-by unit | L.S. | 3,000.00 | 3,300 00 | |
| 48. Highway cable fencing | 2,440 l. f. | 1.00 | 1 00 | |
| 49. Highway chain link fencing | 2,620 l. f. | 1.25 | 1 20 | |
| 50. Bit. mac. rd. surf. on new grav. base | 7,700 s. y. | .65 | 80 | |
| 51. Bit. mac. rd. surf. on exist. RR. ballast | 6,000 s. y. | .67 | 80 | |
| 52. Tile gage | L.S. | 500.00 | 250 00 | |
| 53. Flag pole | L.S. | 500.00 | 350 00 | |

## GRADE ELIMINATION
## WYOMING

OWNER: Wyoming State Highway Commission, Cheyenne, Wyo.; W. E. Sutton, resident engineer.

PROJECT: Construction of overhead crossing, approaches and improvements on "A" Street over U.P. RR. Co. tracks; pedestrian underpass and improvements under same railroad tracks on "C" Street.

CONDITIONS: Work to be carried on in congested city traffic. City to do some street paving and improvements in connection with job. Railroad to construct falsework prior to any excavation for subways. All exposed concrete surfaces to be formed with absorptive form lining. To be finished in 270 working days. Rail and highway transportation facilities available. Wages are: skilled, 80c. to $1.12½ per hr.; semi-skilled, 65c.; and common, 55c.

LIST OF BIDDERS: (May 15, 1940)

1. F. M. Kenney, Denver, Colo. (contract) . . . . . $132,169
2. A. S. Horner, Denver, Colo. . . . . 134,809
3. Gibbons & Reed, Salt Lake City, Utah . . . . . 144,518
4. Northwest Engineering Co., Rapid City, S. Dak. . . . . 146,000
5. George W. Condon Co., Omaha, Nebr. . . . . 146,658
6. E. E. Peterson, Casper, Wyo. . . . . 151,935
7. Blanchard Bros., Cheyenne, Wyo. . . . . 162,622
8. Rognstad-Olsen, Casper, Wyo. . . . . 171,570
9. McLaughlin Constr. Co., Livingston, Mont. . . . . 172,256
10. Inland Constr. Co., Omaha, Nebr. . . . . 188,087

| Item | Quan. | Unit Prices (1) | (2) | (3) |
|---|---|---|---|---|
| 1. Excavation | 3,400 c. y. | $0.50 | $0.60 | $0.75 |
| 2. Structure excavation | 165 c. y. | .75 | 2.00 | 1.00 |
| 3. Dry excavation, bridges | 2,160 c. y. | .75 | 2.00 | 1.25 |
| 4. Excavation for drains | 300 c. y. | 1.00 | 1.50 | 1.00 |
| 5. Watering (embankment) | 30 M gal. | 3.00 | 5.00 | 2.50 |
| 6. Roller operation (embank.) | 20 hr. | 3.00 | 6.00 | 3.00 |
| 7. Mechanical tamping | 750 hr. | 1.50 | 1.50 | 2.00 |
| 8. Class A concrete | 1,139.7 c. y. | 18.00 | 19.00 | 19.00 |
| 9. Class AA concrete | 614.6 c. y. | 19.50 | 21.00 | 22.00 |
| 10. Reinforcing steel | 207,200 lb. | .045 | .048 | .05 |
| 11. Structural steel | 945,925 lb. | .0625 | .058 | .055 |
| 12. 12-in. vitr. clay pipe | 564 l. f. | .85 | 1.00 | 1.25 |
| 13. 8-in. vitr. clay pipe | 100 l. f. | .70 | .60 | .50 |
| 14. Blast boards | 1,300 s. f. | .90 | 1.20 | .60 |
| 15. Lighting system | L.S. | 3,000.00 | 2,400.00 | 2,500.00 |
| 16. White conc. traffic marker | 521 l. f. | .20 | .60 | .25 |
| 17. Cu. yd. mile haul | 6,500 c. mi. | .10 | .15 | .20 |
| 18. Cr. gravel base crse, 1-in | 700 ton | 1.50 | 1.60 | 1.50 |
| 19. Cr. gravel, surf., ¾-in | 220 ton | 1.50 | 1.75 | 1.25 |
| 20. Base treatment, MC-1 | 900 gal. | .10 | .12 | .10 |
| 21. Seal coat, RC-4 | 750 gal. | .10 | .12 | .10 |
| 22. Med. curing liq. asph., distr. MC-3 | 2,900 gal. | .10 | .12 | .10 |
| 23. Processing roadway | 2,050 s. y. | .10 | .05 | .10 |
| 24. Stone chips | 30 ton | 3.00 | 3.50 | 4.00 |
| 25. Watering (base) | 10 M gal. | 3.00 | 5.00 | 2.50 |
| 26. Roller operation (base) | 10 hr. | 3.00 | 6.00 | 3.00 |
| 27. Rein. conc. proj. markers | 2 ea. | 20.00 | 25.00 | 20.00 |
| 28. Excav., incl. haul | 805 c. y. | .70 | .70 | .75 |
| 29. Structure excavation | 1,630 c. y. | 1.40 | 2.00 | 1.50 |
| 30. Mechanical tamping | 340 hr. | 2.00 | 1.50 | 2.00 |
| 31. Class A concrete | 136 c. y. | 16.50 | 18.00 | 18.00 |
| 32. Class AA concrete | 316.3 c. y. | 19.50 | 19.00 | 20.00 |
| 33. Reinforcing steel | 46,760 lb. | .045 | .046 | .05 |
| 34. Structural steel | 10,290 c. y. | .145 | .09 | .14 |
| 35. Lighting system | L.S. | 1,000.00 | 1,250.00 | 1,500.00 |
| 36. Rein. conc. project markers | 2 ea. | 20.00 | 25.00 | 20.00 |
| 37. Drainage system | L.S. | 500.00 | 500.00 | 450.00 |
| 38. Frost proof sewer covering | 520 s. f. | 1.00 | .50 | 1.25 |
| 39. 3-ply membrane waterproofing | 400 s. y. | 1.50 | 1.25 | 1.50 |
| 40. Asphalt sand mastic | 103 s. y. | 3.00 | 2.00 | 1.50 |